IAB members present:
Colin Baldwin, Jim Barnes, Paul Beiser, Bruce Doyle, Jim Cale, Chuck Duey, Scott Evans, Dan Ferguson, Tom Ferraro, Jason Gentry, Elena Gonzalez, Jim Greener, Bob Gresham, Michael Kotson, Scott Lukes, Scott Makinen, Steve Martin, John Nichols, Randy Paffenroth, Chuck Quire.

ECE department present:
Anura Jayasumana, Andrea Leland, Tony Maciejewski, Olivera Notaros, Sudeep Pasricha, HJ Siegel, and a group of ECE undergraduate students.

Guests: Scott Higgins, Schneider Electric; Bob Bower, Industrial Liaison Officer for the NSF ERC for Extreme Ultraviolet Science and Technology; Terry Comerford, College of Engineering Career Counselor; and Jill Higham, College of Engineering Development Officer.

1. Introduction and Welcome (Scott Makinen, IAB president)
Scott opened the meeting by welcoming new IAB members: Bruce Doyle, Broadcom; and Tom Ferraro, National Instruments. He also introduced guests: Jim Cale, NREL; Scott Higgins, Schneider Electric; and Steve Martin, Avago Technologies.

2. Department Update (ECE Department Head Tony Maciejewski)
Tony began his presentation by providing an update on his sabbatical. He then gave his department update, addressing the following topics:

- **College update:**
  - Dean search underway; update: Dr. David McLean, former director of the Transportation Research Center at Washington State University, hired as new dean
  - Jill Higham hired to focus on corporate relations and development

- **Faculty news:**
  - ECE faculty dominate CSU awards ceremony
    - Branislav Notaros received Board of Governors Excellence in Teaching Award
    - Carmen Menoni received Scholarship Impact Award
    - Chandra received Innovative Excellence Award by CSU Ventures
  - New ECE professors bolster research
    - Advanced Beam Lab recently completed – ACTION ITEM: visit lab as part of future IAB meeting
Signed IMOU with University of Twente; electron accelerator donated
- Laser System donated by Boeing Directed Energy Systems
- Prof. Notaros receives IEEE Outstanding Engineering Educator Award
- Prof. Pasricha wins Air Force Office of Scientific Research Young Investigator Award
- Math Prof. Margaret Cheney, who has a joint appointment in the ECE department, to deliver Sonia Kovalevsky Lecture
- Prof. Menoni recognized at SPIE conference for Best Oral Presentation
- Prof. Siegel honored by Governor as High Park Fire first responder
- Personnel news:
  - New ECE faculty search underway; update: Sourajeet Roy hired as assistant professor
  - New department advisor hired: Kate Douglass started May 6

Student news:
- E-Days winners: 1st: LARRY (Little Autonomous Retrieval Robot "Y"); 2nd: CSU Antenna Test Range; 3rd: Underwater ROV (voted best by underclassmen)
- Open Design Competition a success
- Senior Royce Quintana honored by CSU with First Generation Award
- 6th Annual Best Paper Contest set for May

Graphs and charts:
- College of Engineering research expenditures
- ECE research expenditures
- National enrollment trends
- ECE spring enrollment
- Undergraduate degrees awarded
- Freshman enrollment
- Enrollment trends by class
- Graduate degrees awarded
- Percent of international degrees awarded

Action item: Show gender demographics in the future.

ABET update:
- IAB input drives continuous improvement – important actions taken since last ABET review based on IAB suggestions and ideas:
  - ECE seminar series created (2007)
  - Senior design program changes (2007-present)
    - Communication skills emphasized
    - Increased industry involvement
    - Three new papers expected: project plan w/deliverables, test plan, and ethics paper
  - Systems Engineering program launched (2008)
  - ECE 202 changes – course project added to syllabus (2009)
  - Power & Energy program bolstered (2010); two new faculty hired in this area
- Design Your Future Day created (2010)
- I/O diagrams developed for core undergraduate courses (Tiger Team, 2010)
- Student lounge refurbished (Tiger Team, 2011)
- Online certificate and degree program launched (2011)
- Math 161 created specifically for ECE students (collaboration with Math Dept., 2012)

- Technology and higher education
  - Massive Open Online Courses (MOOCs)
    - Online courses aiming at large-scale interactive participation and open access via the web
    - Include traditional course materials and provide interactive user forms that help build community
    - MOOCs do not offer academic credit or charge tuition fees
      - Only about 10% of the tens of thousands of students who may sign up complete the course
    - edX (MIT/Harvard), Coursera (Stanford), Udacity (Stanford), Khan Academy
  - The value of a college degree
    - Charts:
      - Median first-year earnings by CO institution
      - Median first-year earnings in EE by CO institution

3. **Overview of Industry Membership Program, NSF Engineering Research Center for Extreme Ultraviolet Science and Technology (Bob Bower, Industrial Liaison Officer)**
Bob delivered an informative presentation about the NSF EUV ERC industrial outreach program and its board members. He shared examples of the work underway at the EUV ERC and the industry partners who support it.

4. **Industry Spotlight: Schneider Electric (Scott Higgins, VP Utilities)**
Scott shared a broad overview of Schneider Electric and its 175 year history, touching on the company’s mission to improve the energy dilemma: energy demand versus the need to reduce energy consumption. Scott also discussed the importance of partnering with institutions like CSU to advance its mission, particularly in the area of smart grid business.

5. **ABET Survey**
The IAB participated in a survey to provide feedback on the department and assess its students’ progress toward achieving the program outcomes. The results were included in the department’s ABET report, which was submitted in July.

6. **Breakout session: How Technology is Changing the Delivery of Education (Facilitator: Scott Makinen)**
The board split into groups to discuss and brainstorm the following:
- Massive Open Online Courses
  - What is the value of learning on campus?
  - How do we stay competitive and create new opportunities for learning?
The Value of a College Degree
  o How do we deal with public policy makers and dispel the perception that a higher degree doesn’t necessarily pay off?

Social Media
  o How do we effectively integrate social media tools into our programs?

Results of breakout session:

Massive Open Online Courses

The board discussed MOOCs and shared their opinions regarding the department’s role in this online learning environment:
  • A benefit of MOOCs is that they provide on-demand learning – students can “fast forward and rewind.”
  • MOOCs are often well designed lectures by leaders in the field. Instructors have a practiced instructional style. They have tricks, like pacing, and they don’t typically make many mistakes.
  • When done well, MOOCs can serve as an excellent marketing tool for a program. If people like the course, the word will spread quickly.

Tony posed the question to the IAB: There is no question that we should be involved in distance and online education. However, there is a distinction between MOOCs and CSU distance coursework. Where should we play? Should I ask my faculty to spend countless hours to create content for free online courses or have them continue to focus on the for-profit accredited coursework that we currently offer?

  • Some board members believe the department needs to participate in MOOCs and that a high profile professor should develop a course to demonstrate leadership in the field. If the MOOC does not feature top-notch instruction and learning, the department misses an opportunity: MOOCs are a way to project an image and hook students.
  • The course should be used as a marketing tool. They noted that CU Boulder offers a Power Electronics course via Coursera.
  • Pressing questions: Will MOOCs remain free? How will accreditation be handled? The board predicts a lot of changes over the next couple years.

Tony noted: What about credit for MOOCs? Should CSU give students credit, and/or should we have some mechanism for evaluating whether they have learned anything?

The board agreed that this is a problem and that someone needs to verify that the student did well in the MOOC.

Tony: The ECE department has a policy that allows student to test out of any course. This may be one solution. They can show proficiency by taking a certain number of exams, labs, etc. They
may not get credit, but they can move on. Could we do that in volume? That’s another question. Plus, students don’t get a grade.

- One idea for integrating MOOCs into the ECE program builds on the flipped classroom model. Instead of having students spend their time in the classroom listening to professors give lectures, they get their content in advance through MOOCs. Classroom time is spent in discussion and collaboration, while MOOCs help them prepare. Grade schools are already using this format.

The Value of a College Degree
The value of the university experience was debated. The board discussed the following benefits of learning on campus:
- Research – students are not going to get the same experience online. Even for undergraduate students, it’s beneficial to “see” the research early in their academic career.
- There is value in face-to-face learning.
- Group learning is important (peer support).
- There is value in positive peer pressure, i.e., pressure to finish, competition to excel, etc.
- On campus courses give students a feel for the culture (classroom setting, common lingo, how students interact, etc.).
- Undergraduates are more likely to benefit from on campus coursework because they are learning how to be a student, how to succeed, and how to get a job; corporate people are more experienced and prepared for the online learning format.
- The on campus university experience is formative for young adults, as they are just moving outside the home.
- More mentoring opportunities are available on campus; online lectures are wonderful (online MOOCs) but students don’t have the mentorship and personal attention.

With rising tuition costs and a struggling economy, there is a growing perception that a college degree no longer pays off. The board provided points to underscore the importance of a college degree:
- A college degree is still important and receiving a degree from a highly recognized, accredited institution is essential.
- The department needs to help students understand that a degree, particularly in ECE, pays off. Engineers often make more money and have more opportunities than graduates from other disciplines.

Social Media
The board provided their feedback about the department’s role in social media:
- Most board members do not feel that they are well suited to determine the best method to improve the department’s social media presence. They believe it should be led by students.
Create a CSU-ECE YouTube Channel and require senior design students to create project videos as part of their course requirements. This would be good for the students’ resumes and would help promote the department.

It’s important to have a Facebook page and an RSS feed for marketing purposes.

7. IAB Elections
The board unanimously voted in favor of Scott Evans as the new IAB vice president. Jason Gentry becomes IAB president. Special thanks to outgoing president, Scott Makinen, for two years of outstanding leadership.

8. Student Design Presentations – Two teams of students presented their senior design projects to the board:
   - CSU Antenna Test Range
     Team members: Brent Atkinson, Daryl Freeman, Aaron Haller, and Kaiyan Sheng
     Advisor: Prof. Branislav Notaros
   - Underwater Remote Operated Vehicle (NEMO)
     Team members: Rachel Dondero, Justin Kopacz, and Sarah Romer
     Advisor: Prof. Tony Maciejewski

9. Closing Remarks (Tony Maciejewski)
Tony wrapped up the meeting and thanked the board for their participation. He encouraged the board to contact him or Andrea with additional ideas or comments regarding the meeting topics. Some members participated in the tour of the new engineering building (Scott Building) following the meeting. The new facility opens this fall.

ACTION ITEMS:
- Visit new Advanced Beam Lab as part of a future IAB meeting.
- Show gender demographics as part of future department updates.
- Determine ECE’s role in the world of MOOCs. Use the opportunity as a recruitment tool and consider creating a course by a high profile professor to gain international recognition.
- Help the public understand the importance of an engineering degree by publicizing salary benefits and job opportunities.
- Create a YouTube channel for ECE.
- Explore the idea of requiring senior design students to create project videos. The videos would also be used to promote the department.
- Maintain the department Facebook page and establish an RSS feed for marketing purposes. Social media efforts should be led by students.

The fall IAB meeting is scheduled for Friday, October 25.